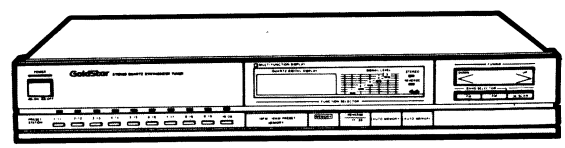
GoldStar

STEREO SYNTHESIZER TUNER

SERVICE MANUAL

CAUTION

BEFORE SERVICING THE CHASSIS, READ THE "SAFETY PRECAUTION" IN THIS MANUAL.



MODEL: GST-9320

GoldStar

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SAFETY PRECAUTION

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual, electrical components having such features are identified by a ⚠ in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

SPECIFICATIONS

FM SECTION

1. Tuning coverage ..... 87.5 MHz–108.0 MHz
2. 30 dB usable sensitivity (S/N 50 dB, Mono, ANT: 30 MHz, 90.1 MHz) ..... 5 μV
3. Signal-to-noise ratio (60 dB input, IHF-A, 98.1 MHz) ..... Mono: 82 dB
   Stereo: 76 dB
4. Image rejection (at 106.1 MHz) ..... 90 dB
5. IF rejection (at 90.1 MHz) ..... 100 dB
6. Distortion (at 98.1 MHz) ..... Mono: 0.1%
   Stereo: 0.15%
7. Audio response (at Pre-emphasis) ..... 20 Hz–15,000 Hz
8. Separation ..... 100 Hz: 45 dB, 1 kHz: 50 dB, 10 kHz: 40 dB

MW SECTION

1. Tuning coverage ..... 522 kHz-1611 kHz
2. Usable sensitivity 603 kHz, 1088 kHz, 1404 kHz (20 dB S/N) ..... 300 μV/m
3. Image rejection (at 1404 kHz) ..... 35 dB
4. IF rejection (at 603 kHz) ..... 40 dB
5. Selectivity ..... 40 dB
6. Signal-to-noise ratio (94 dB input, at 1008 kHz) ..... 50 dB
7. Audio response ..... 80 Hz-2300 Hz

LW SECTION

1. Tuning coverage ..... 146-353 kHz
2. Usable sensitivity ..... 400 μV/m
3. Image rejection ..... 35 dB
4. Signal-to-noise ratio ..... 50 dB

GENERAL

1. Power requirements ..... AC 220V, 50 Hz
2. Power consumption ..... 8 W
3. Dimension (Width × Height × Depth) ..... 430 × 70 × 310 (mm)
4. Weight ..... 3.5 Kg

NOTE: Specifications for this model are subject to change without prior notice.

NAMES OF CONTROL PARTS

[1] POWER Switch
[2] PRESET STATION Buttons
[3] Tuning Frequency Display
[4] SIGNAL LEVEL
[5] STEREO Indicator
[6] REVERSE Indicator
[7] Auto Memory Indicator
[8] BAND SELECTOR
[9] TUNING Button
[10] Memory/Scan Button
[11] AUTO/MANUAL Button
[12] AUTO MEMORY Button
[13] REVERSE Button
[14] MEMORY Button
[15] PRESET MEMORY Button
[16] Antenna Terminals
[17] OUTPUT Jacks
[18] Power Cord

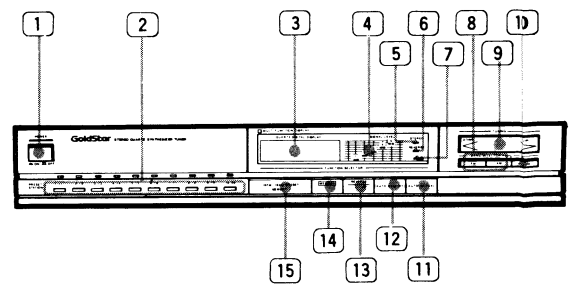


Figure 1 Front View

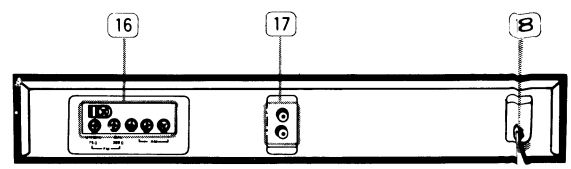


Figure 2 Back View

NOTE: For a complete description of the operation of this unit, please refer to the owner's manual.

ADJUSTMENTS

This tuner has been aligned at the factory and normally will not require further adjustment. As a result, it is not recommended that any attempt is made to modificate any circuit. If any parts are replaced or if anyone tampers with the adjustment, realignment may be necessary.

ADJUSTMENT & TEST POINTS

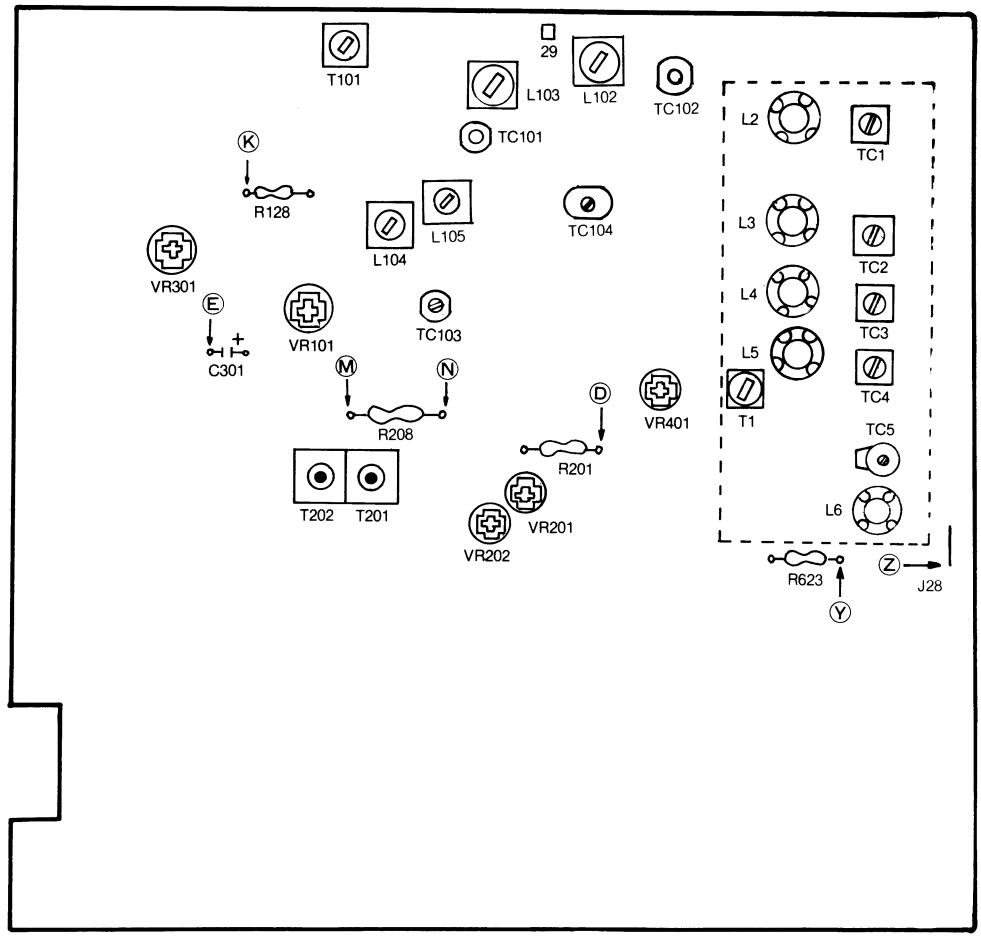


Figure 3 Main P.C. Board

1. MW/LW IF ADJUSTMENT

IF genescope ..... Connect the input to test point Ⓚ and the output to test point 29 (AM IN)

Adjust for the IF wave form of genescope to be maximum.

IF	Adjust for	Adjustment
455 kHz	Maximum	T101

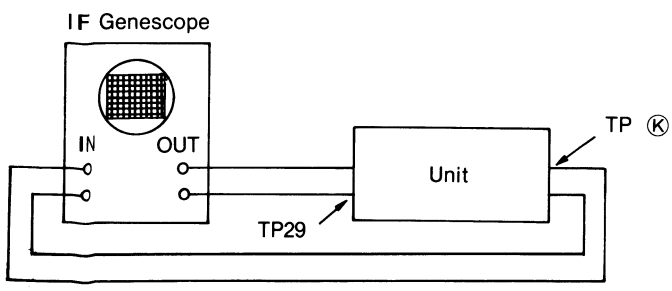


Figure 4 MW/LW IF Alignment Connection Diagram

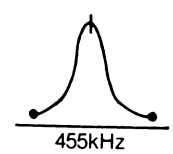
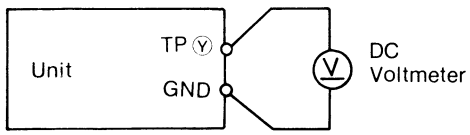


Figure 5 MW/LW IF Curve

2. MW COVERAGE ADJUSTMENT

DC voltmeter ..... Connect to test point Ⓨ and GND.

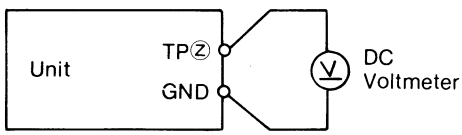


Step	Frequency	Adjust for	Adjutment
1	522 kHz	4.3 V	L104
2	1611 kHz	24.5 V	TC103
3	Repeat steps 1 and 2 until no further improvement can be made.		

Figure 6 MW Coverage Alignment Connection Diagram

3. LW COVERAGE ADJUSTMENT

DC voltmeter ..... Connect to test point Ⓩ and GND.



Step	Frequency	Adjust for	Adjustment
1	146 kHz	7 V	L105
2	353 kHz	22.5 V	TC104
3	Repeat steps 1 and 2 until no further improvement can be made.		

Figure 7 LW Coverage Alignment Connection Diagram

4. MW/LW TRACKING ADJUSTMENT

Signal generator ..... Connect to the MW antenna coil through the loop antenna. Adjust for the indication of electronic voltmeter of the wave form of oscilloscope to be maximum.

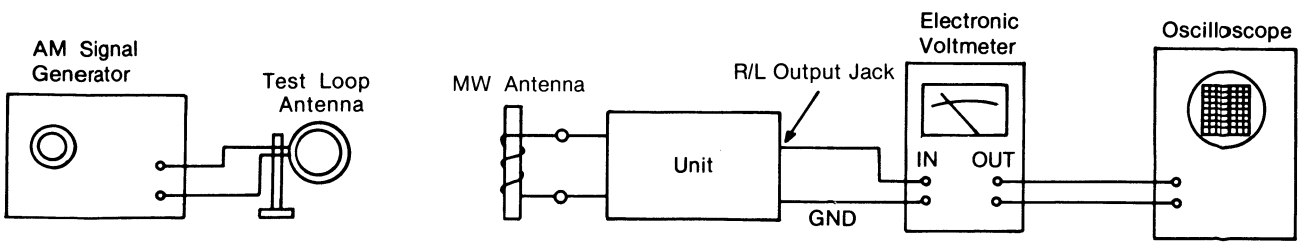
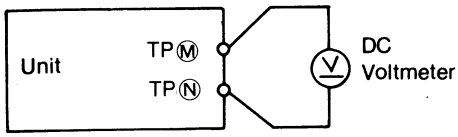


Figure 8 MW/LW Tracking Alignment Connection Diagram

Step	Frequency	Adjust for	Adjust for	Adjustment
1	MW Tracking	594 kHz	Maximum sensitivity	L103
2		1404 kHz	Maximum sensitivity	TC101
3		Repeat steps 1 and 2 until no further improvement can be made.		
4	LW Tracking	164 kHz	Maximum sensitivity	L102
5		299 kHz	Maximum sensitivity	TC102
6		Repeat steps 4 and 5 until no further improvement can be made.		

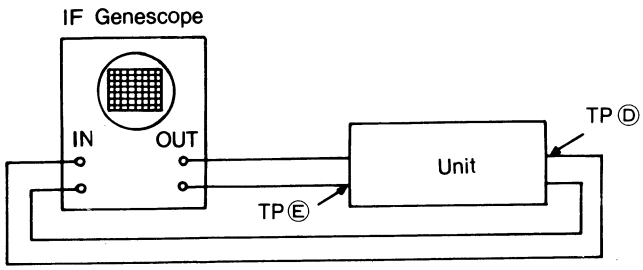
5. FM IF ADJUSTMENT

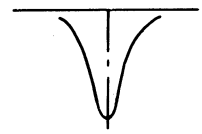
IF genescope ..... Connect the input to test point Ⓔ and the output to test point Ⓓ.
DC voltmeter ..... Connect to test point Ⓜ and Ⓝ.



Step	Adjust for	Adjustment	Remark
1	0 V	T201	See figures 9 and 11.
2	Maximum liner S Curve	T1	See figures 10 and 12.

Figure 9 FM IF Alignment Connection Diagram





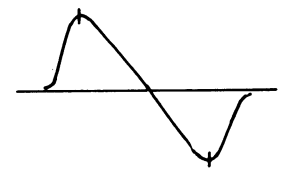


Figure 10 FM IF Alignment Connection Diagram **Figure 11 FM IF Curve** **Figure 12 FM "S" Curve**

6. FM RF (COVERAGE & TRACKING) ADJUSTMENT

Signal generator ..... Connect to FM antenna terminal (FM IN) through the dummy.
Electronic voltmeter ..... Connect to test point Ⓨ and GND.

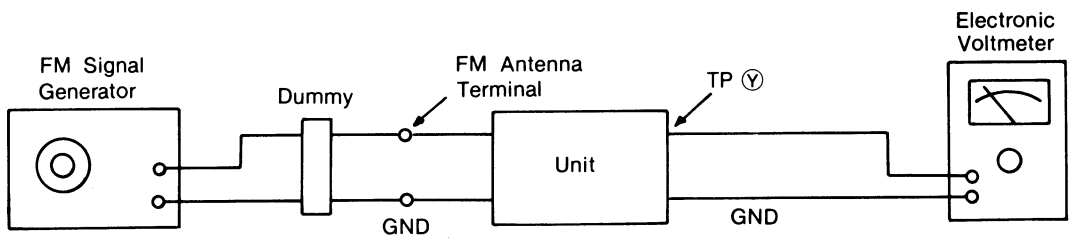


Figure 13 FM RF Alignment Connection Diagram

Step	Test Stage	Frequency	Adjust for	Adjustment
1	Band Coverage	87.9 MHz	4.5 V	L6
2		107.9 MHz	24.5 V	TC5
3		Repeat steps 1 and 2 until no further improvement can be made.		
4	Tracking	90.1 MHz	Maximum Sensitivity	L2, L3, L4, L5
5		106.1 MHz	Maximum Sensitivity	TC1, TC2, TC3, TC4
6		Repeat steps 4 and 5 until no further improvement can be made.		

7. FM T.H.D. ADJUSTMENT

Signal generator ..... Connect to FM antenna terminal (FM IN) through the dummy.
Distortion meter ..... Connect to the output.

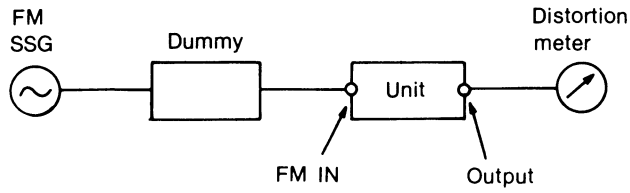


Figure 14 FM THD Alignment Connection Diagram

Frequency	Adjust for	Adjustment
98 MHz	Minimum T.H.D.	T202

NOTE: At this time, the DC voltage between test point Ⓜ and Ⓝ should be realigned by T201 to keep on 0 voltage, because the "S" curve may be detuned.

8. FM MPX ADJUSTMENT-SEPARATION

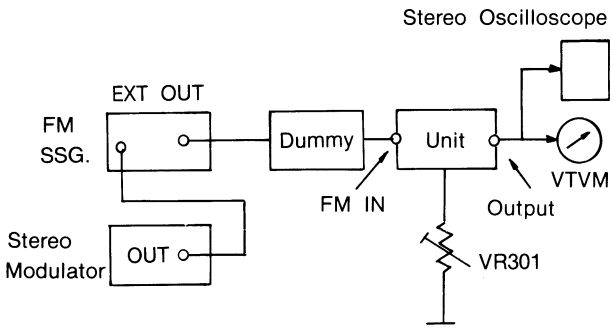


Figure 15 FM MPX Connection Diagram

Pilot Signal	Adjust for	Adjustment
ON	Difference of R and L must be maximum	VR 301

NOTE: In case of adjusting the stereo separation, if input is L (or R) channel, R (or L) channel must be maximum.

9. FM STEREO BEACON SENSITIVITY & AUTOMATIC SEARCH LEVEL ADJUSTMENT

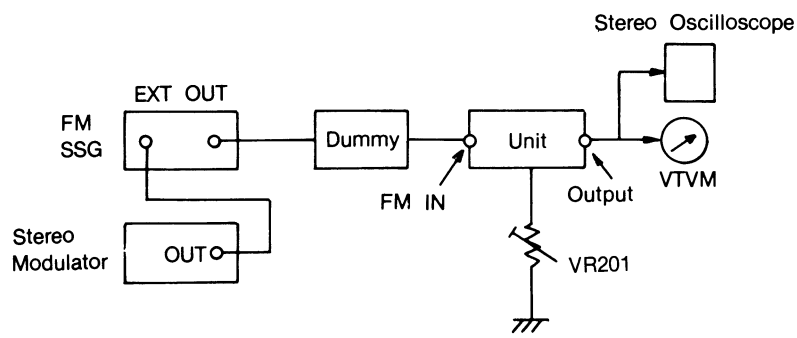


Figure 16

Pilot signal	Input of FM IN	Adjust for	Adjustment
ON	10 μV	Stereo LED Lamp-ON	VR201

10. MW SIGNAL LED METER ADJUSTMENT

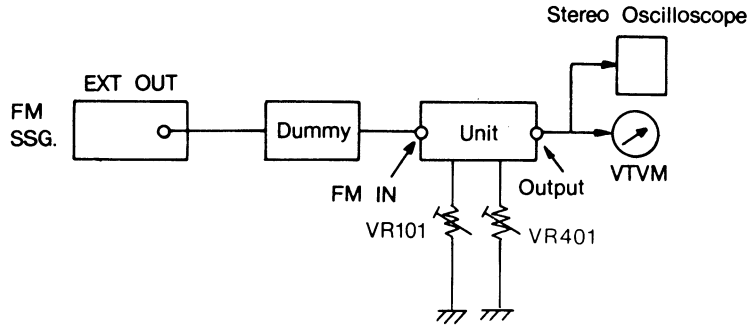


Figure 17

Light up the two LEDs in MW usable sensitivity level (40 dB), adjust VR101 and VR401 so as to light up all the five LEDs at standard input 72 dB.

11. FM SIGNAL LED METER ADJUSTMENT

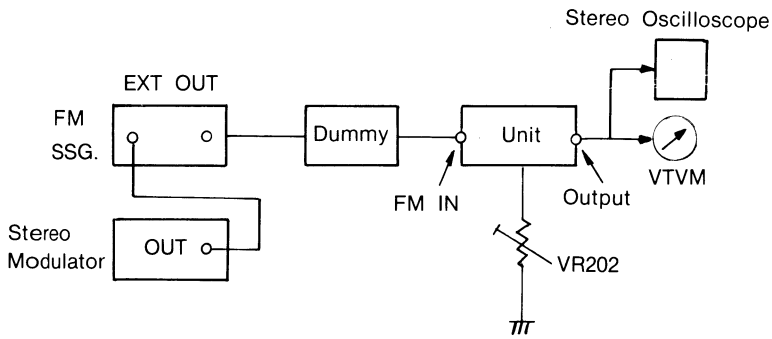
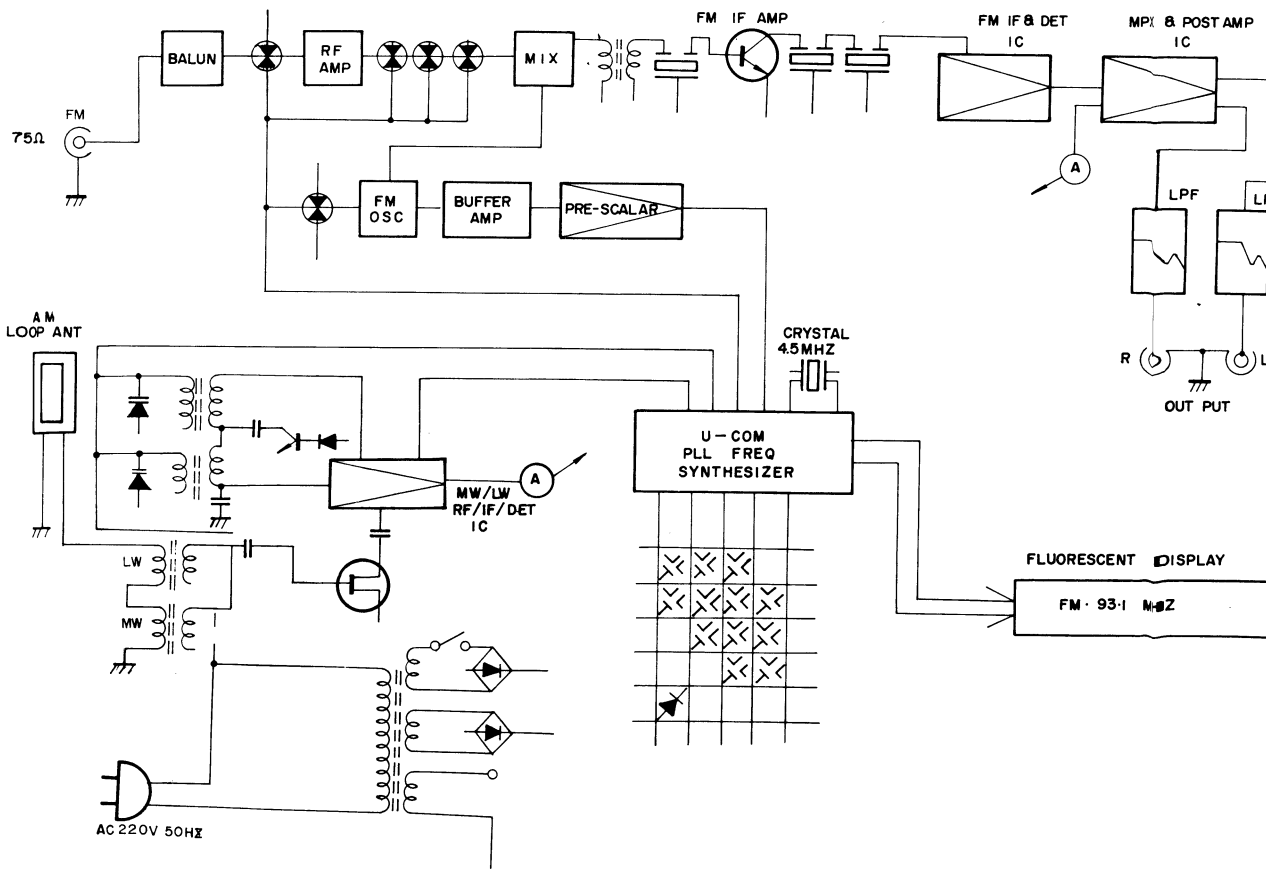
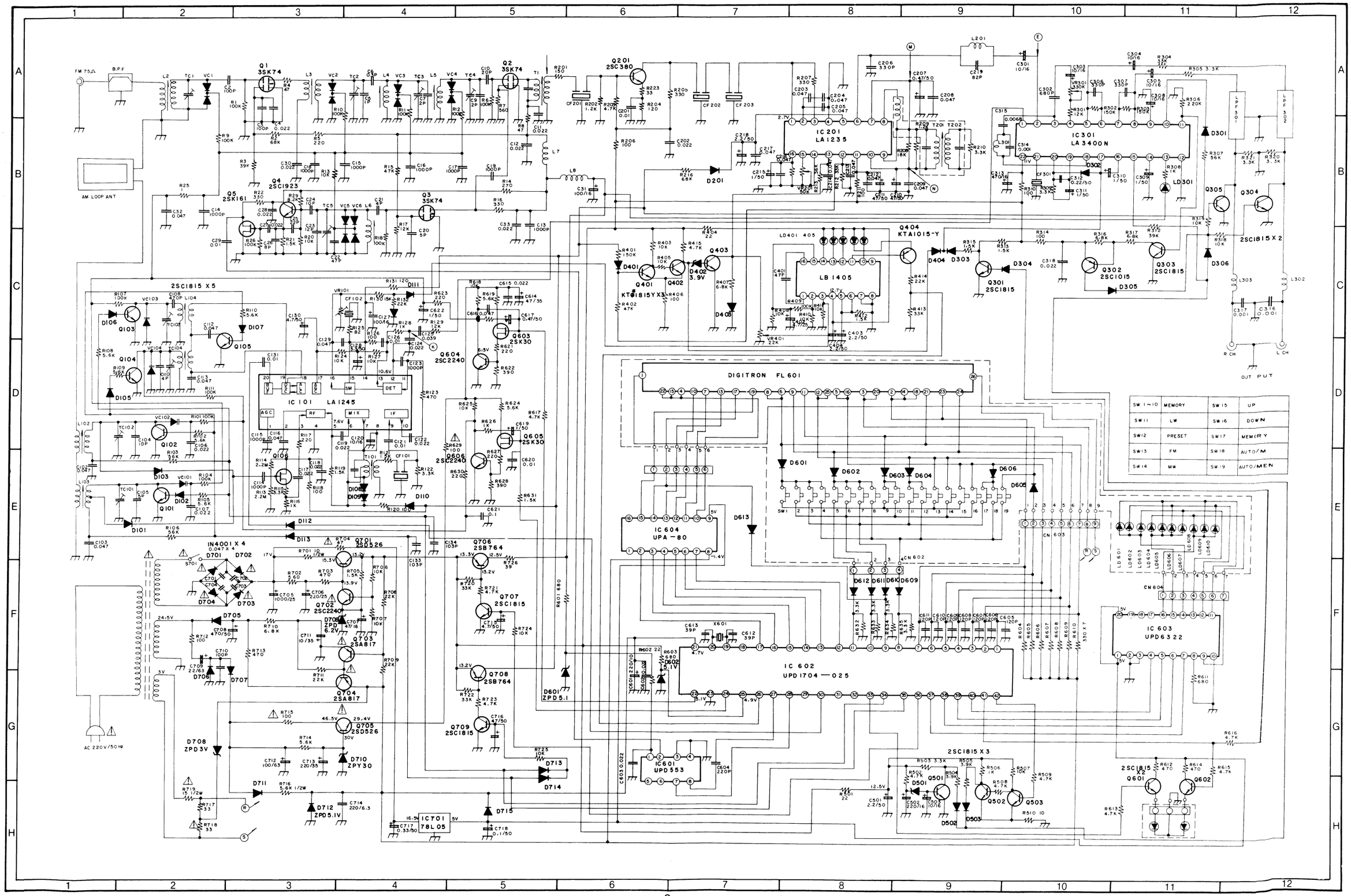


Figure 18

Light up the LEDs in FM automatic search level (using the 300 ohm dummy), adjust VR202 so as to light up all the five LEDs at standard input 72 dB.

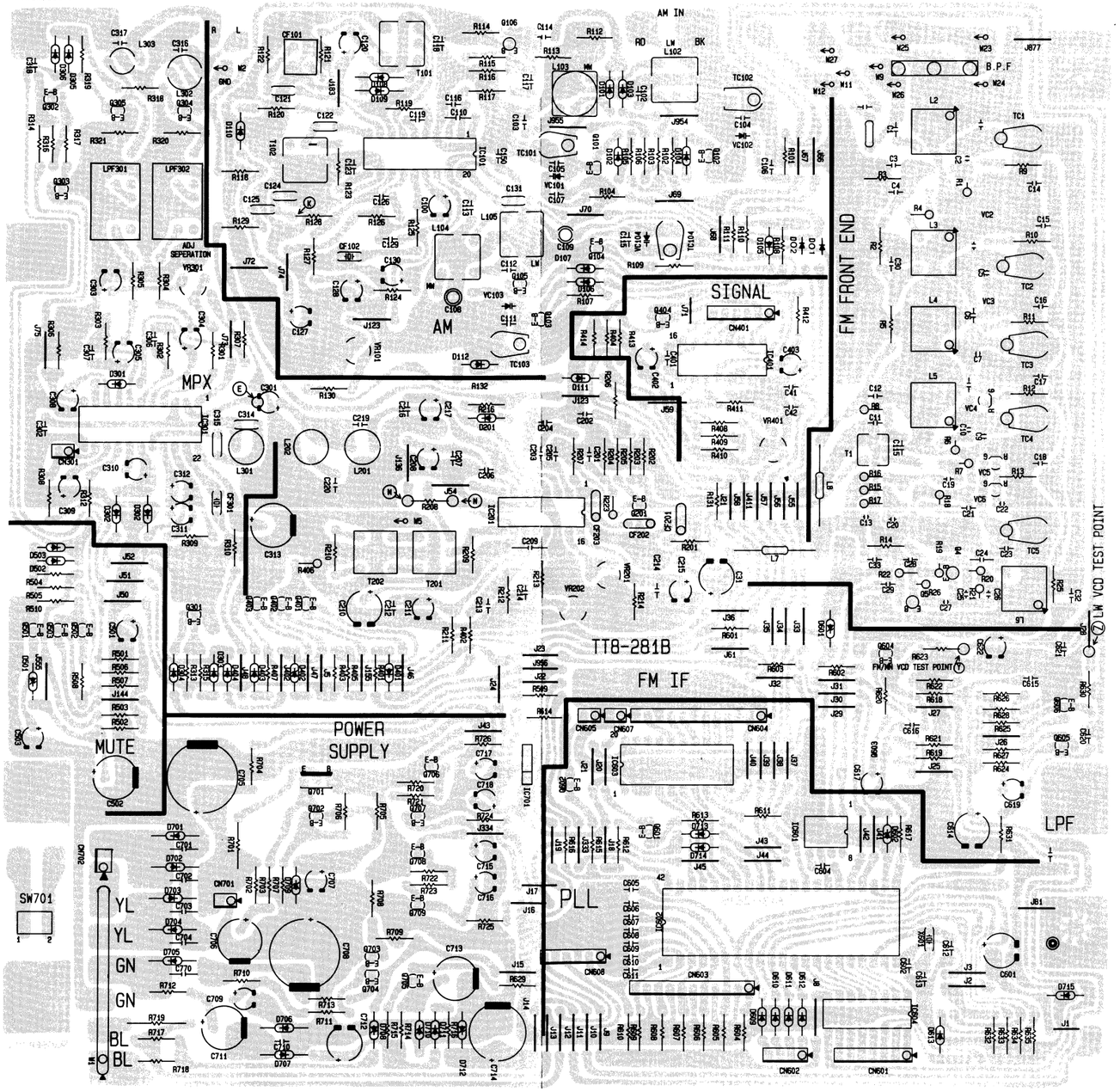
BLOCK DIAGRAM



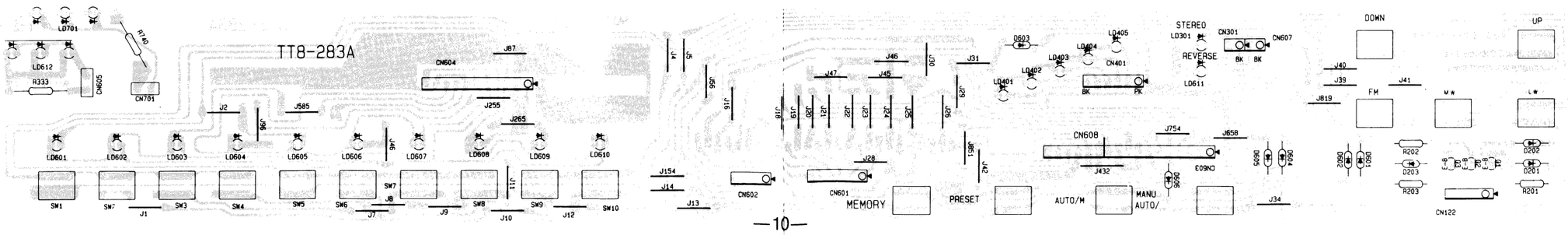

Q1 3SK74
Q2 3SK74
Q3 3SK74
Q4 2SC1923
Q5 2SK161
Q201 2SC380
IC 201 LA1235
IC 301 LA3400N
IC 101 LA1245
IC 602 UPD1704—025
IC 603 UPD6322
IC 604 UPA-80
IC 601 UPD553
IC 701 78L05
LB 1405
LD401 405
Q404 KTA1015-Y
Q401 KTC1815Y X3
2SC1815 X5
2SC1815 X2
2SC1815 X3
DIGITRON FL 601
AM LOOP ANT
AC 220V/50Hz
OUT PUT
R CH
L CH
SW 1~10 MEMORY
SW11 LW
SW12 PRESET
SW13 FM
SW14 MW
SW15 UP
SW16 DOWN
SW17 MEMORY
SW18 AUTO/M
SW19 AUTO/MEN

PCB LAYOUT

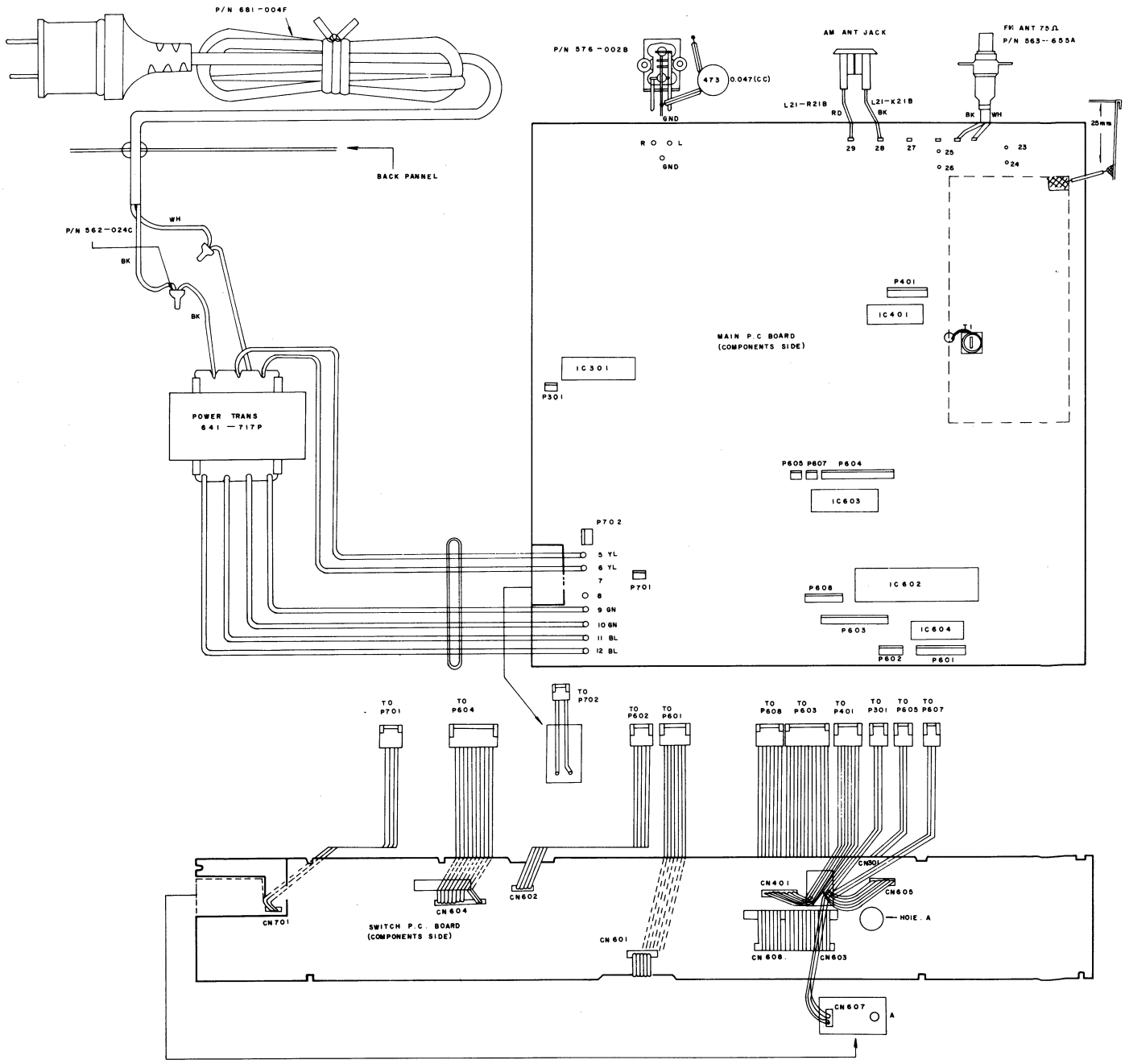
•MAIN P.C. BOARD



•SWITCH P.C. BOARD

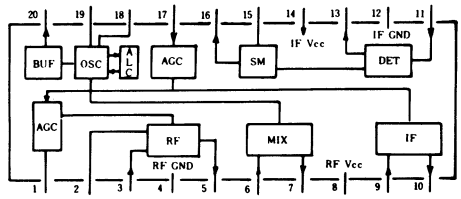


WIRING DIAGRAM

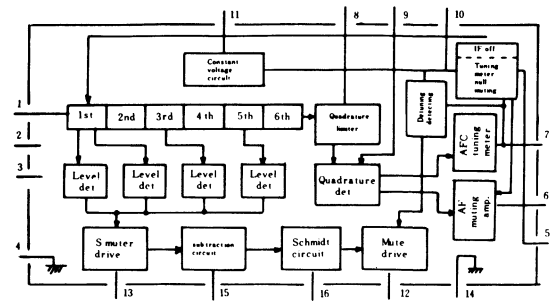


IC EQUIVALENT CIRCUITS

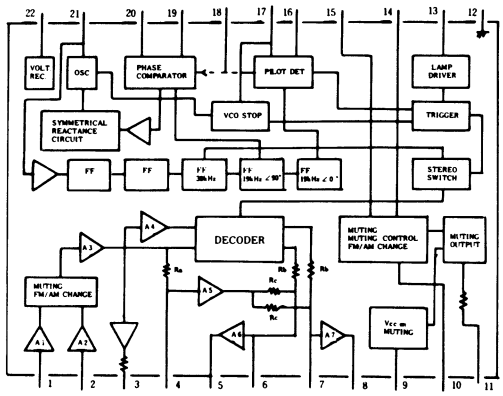
IC101 LA1245



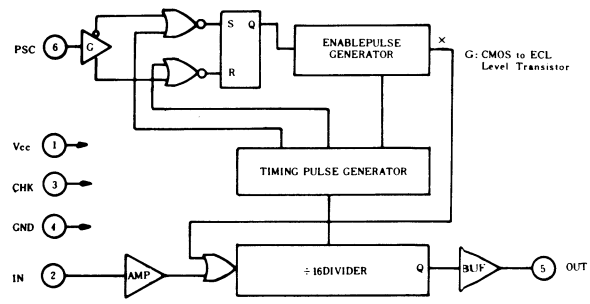
IC201 LA1235



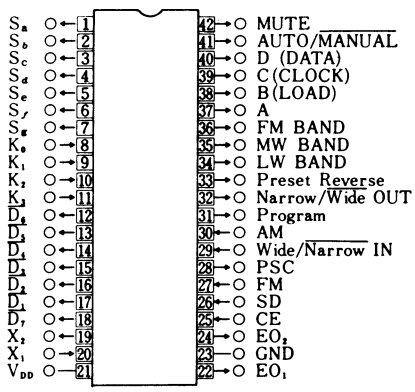
IC301 LA3400N



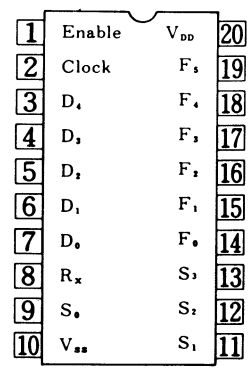
IC601 μPB553AC



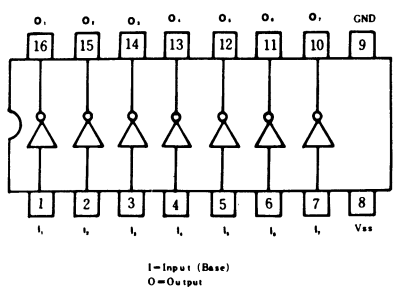
IC602 μPD1704-025



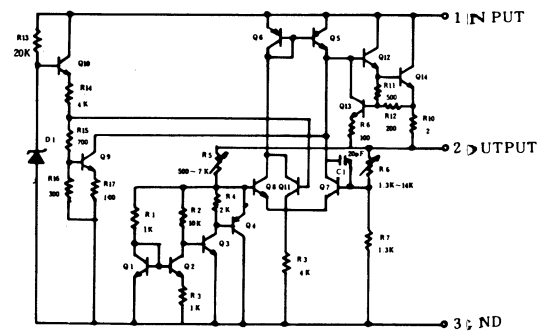
IC603 μPD6322



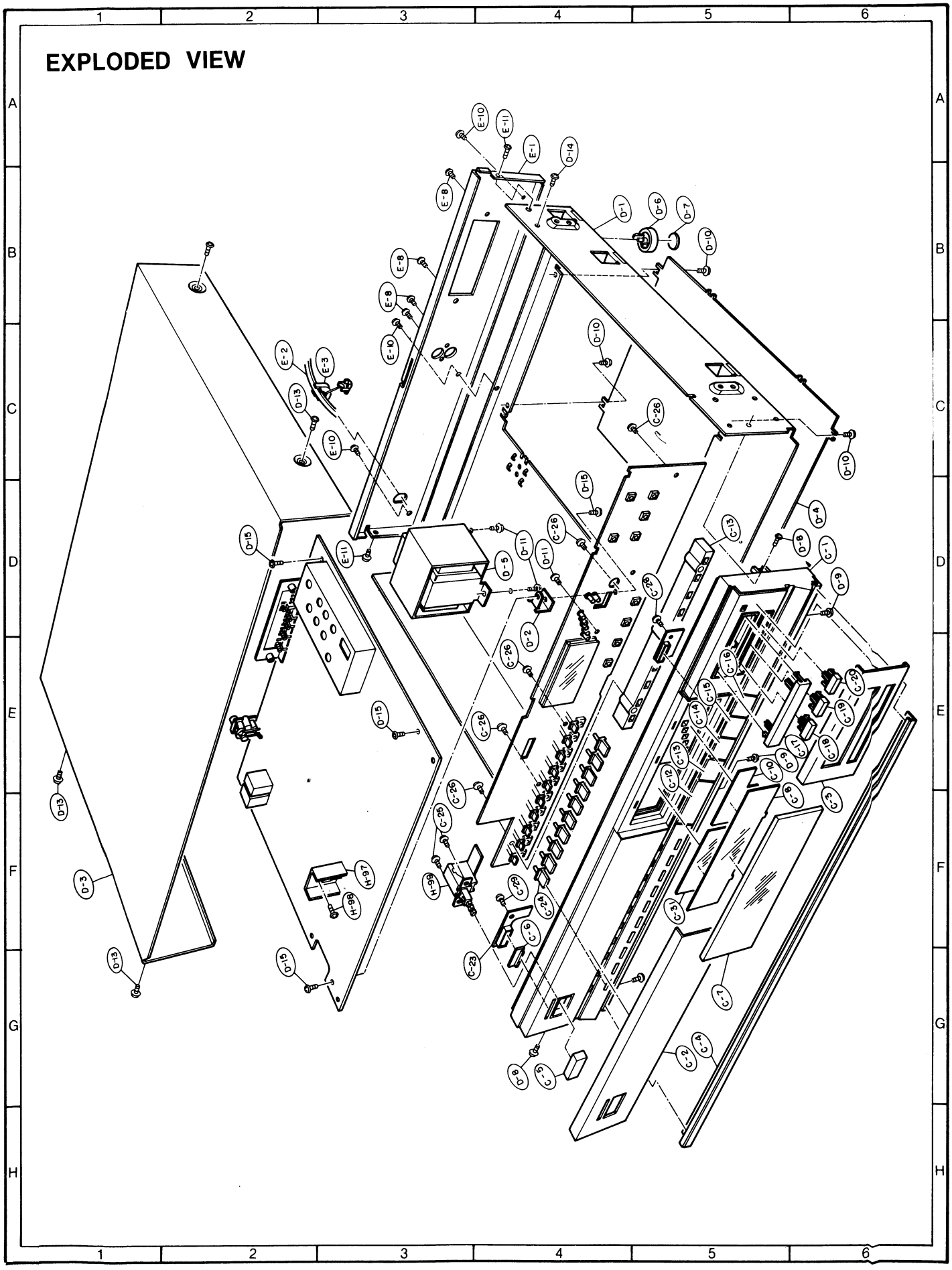
IC604 μPA80C



IC701 μPC78L05



EXPLODED VIEW



REPLACEMENT PARTS LIST

NOTE: Parts marked with "⚠ are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

REF. NO.	PART NO.	DESCRIPTION
	INTEGRATED CIRCUITS	
IC101	668-093A	LA1245, AM IF
IC201	668-650A	LA1235, FM IF
IC301	668-301B	LA3400N, MPX
IC401	668-132A	LB1405, LED Drive
IC601	668-097A	μPB553AC, Prescalar
IC602	668-096B	μPD1704-025, 3 Band Pllysynt.
IC603	668-096C	μPD6322, Fip Drive
IC604	668-680B	μPA80C, TR Array
IC701	668-044B	μPC78L05J, Regulator
	TRANSISTORS & FETS	
Q1-3	667-014A	FET, 3SK74L
Q4	665-819B	KTC1923-O, NPN
Q5	667-009A	FET, KTK161-Y
Q101-105	665T812B	KTC1815-Y, NPN
Q106	667-009A	FET, KTK161-Y
Q201	665-820B	KTC380TM-O, NPN
Q301	665T812B	KTC1815-Y, NPN
Q302	665T813B	KTA1015-Y, PNP
Q303-305	665T812B	KTC1815-Y, NPN
Q401-403	665T812B	KTC1815-Y, NPN
Q404	665T813B	KTA1015-Y, PNP
Q501-503	665T812B	KTC1815-Y, NPN
Q601,602	665T812B	KTC1815-Y, NPN
Q603	667-010C	FET, KTK30A-Y
Q604	665-817A	KTC2240-GR, NPN
Q605	667-010C	FET, KTK30A-Y
Q701	665-708A	KTD526-O, NPN
Q702⚠	665-817A	KTC2240-GR, NPN
Q703,704⚠	665-833C	KTA817A-O, PNP
Q705⚠	665-708A	KTA817A-O, PNP
Q706	665-600A	2SB764-E, PNP
Q707	665T812B	KTC1815-Y, NPN
Q708	665-600A	2SB764-E, PNP
Q709	665T812B	KTC1815-Y, NPN
	DIODES	
D101-105	652T605B	Switch, 1S2472
D106-110	651T003A	Switch, DS4148
D201	651T003A	Switch, DS4148
D205	651T003A	Switch, DS4148
D301-306	651T003A	Switch, DS4148
D401	651T003A	Switch, DS4148
D402	654-608A	Zener, ZPD3.9
D403,404	651T003A	Switch, DS4148
D501	654-723G	Zener, DZ10B
D502,503	651T003A	Switch, DS4148
D601,602	654-722E	Zener, DZ5.1B
D603-614	651T003A	Switch, DS4148

REF. NO.	PART NO.	DESCRIPTION
D630	651T003A	Switch, DS4148
D701-704⚠	652-005C	Rectifier, DS4001
D705-707	652-005D	Rectifier, DS4002
D708	654-722A	Zener, DZ3.0B
D709	654-723B	Zener, DZ6.2B
D710	654-615F	Zener, ZPY30
D711	652T605B	Switch, 1S2472
D712	654-722E	Zener, DZ5.1B
D713-715	651T003A	Switch, DS4148
LED301	653-636A	LED, SLR54URC3-M, Red
LED401-405	653-636C	LED, SLR54GC3-N, Green
LD610	653-636A	LED, SLR54URC3-M, Red
LD601-610	653-645A	LED, SLB15VW3
LD612	653-647A	LED, Flat LD701VR, Red
LD637	653-647A	LED, Flat LD701VR, Red
LD701	653-647A	LED, Flat LD701VR, Red
VC1-6	654-419A	Varactor, 1SV55
VC101-104	654-420A	Varactor, SVC333A
	COILS	
L2	635-607Z	FM Osc. (White)
L3	635-067W	FM Osc. (Red)
L4,5	635-607Y	FM Osc. (Blue)
L6	635-607X	FM Osc. (White)
L7,8	636-602B	Inductor Fixed 22μH
L102	631-606D	LW RF
L103	631-606B	MW RF
L104	634-602Q	MW Osc.
L105	634-602R	LW Osc.
L201,202	637-601D	Inductor Fixed 2[illegible].8μH
L301	637-601E	Inductor Fixed 78 μH
L302,303	637-604A	Inductor Fixed 47 μH
T1	644-610B	FM IF
T101	644-601B	MW IF
T201	647-606A	Discriminator
	VARIABLE RESISTORS	
VR101	613-002D	Semi-Fixed, 22KB
VR201,202	613-002D	Semi-Fixed, 22KB
VR301	613-002H	Semi-Fixed, 330KB
VR401	613-002D	Semi-Fixed, 22KB
	SWITCHES	
SW601-620	558-026A	Tact, KPT-1105
SW701⚠	554-612F	Push, SDLIP
	FILTERS	
CF101	616-004B	Ceramic, AM SFP450H
CF102	616-021A	Resonator, BFU450C4N

REF. NO.	PART NO.	DESCRIPTION
CF201-203	616-010B	Ceramic, SFE10.7MS3GH
CF301	616-020C	Resonator, CSB456F11
LPF301,302	639-606A	Low Pass
	616-301A	LC (FM)
		TRIMMERS
TC1-4	623-025A	CTY121B273
TC5	623-026A	ECV-1ZW10×31
TC101-103	623-001E	CVN610
TC104	623-001F	CVN620
		MISCELLANEOUS
X601	617-601D	Crystal, 4.500MHz
	659-016B	Display, FIP7G8D
	576-002B	Jack Block, S-436P-2P
	573-002B	Socket, Antenna
		PCB ASSEMBLIES
	511-281B	PCB Assembly, Main
	511-283A	PCB Assembly, Switch
		CABINET PARTS
C-1	258-017A	Panel, Front
C-2	246-004A	Decoration Front-A
C-3	246-009A	Decoration, Front-B
C-4	246-010A	Decoration, Front-C
C-5	273-058A	Knob, Power
C-6	236-059A	Window, Power L.E.D.
C-7	236-006A	Window, Display
C-8	236-033A	Window, Inner
C-10	231-563A	Sheet, Display
C-12	273-035D	Knob, Decoration
C-13	273-013A	Knob, Function (MEMORY)
C-14	273-013M	Knob, Function (REVERSE)
C-15	273-013C	Knob, Function (AUTO/MEMORY)
C-16	273-013D	Knob, Function (AUTO/MANUAL)

REF. NO.	PART NO.	DESCRIPTION
C-17	273-646A	Knob, Volume (Up Down)
C-18	273-041A	Knob, Band (FM)
C-19	273-041H	Knob, Band (MW)
C-20	273-041I	Knob, Band (LW)
C-23	324-023A	Holder, LED
C-24	273-645A	Knob, Preset
C-25	353-025E	Screw, Special 3×6
C-26	353-025G	Screw, Special 3×10
C-28	353-025F	Screw, Special 3×8
C-29	353-025F	Screw, Special 3×8
C-31	236-034A	Window, Filter
D-1	313-003B	Chassis, Bottom
D-2	321-010A	Bracket, PCB
D-3	213-005A	Cabinet
D-4	256-035A	Plate, Bottom
D-5⚠	641-717P	Trans, Power 220V
D-6	265-027A	Foot
D-7	472-610D	Felt
D-8	TRQ1830J	Screw, TRQ2+3×6A
D-9	TRQ1830J	Screw, Tapping TC3+3×6
D-10	TRQ1830J	Screw, TRQ2+3×6A
D-11	MRC2239J	Screw, MRC+4×10
D-13	353-633A	Screw, Special
D-14	TBQ1830J	Screw, TBQ+3×6A
D-15	TRQ1830J	Screw, TRQ2+3×6A
E-1	258-021D	Panel, Back
E-2⚠	324-004F	Cord, Power
E-3	324-348B	Holder, Cord
E-8	TRQ1839I	Screw, TRQ253×10A
E-10	TRQ1380I	Screw, TRQ2+3×6A
E-11	TBQ1830J	Screw, TBQ+3×6
E-12	322-003A	Supporter, Ant-Terminal
H-97	255-039A	Plate, Heatsink
H-98	TRB1836J	Screw, TRQ2+3×8A
H-99	554-612F	Switch, Push
		ACCESSORIES
	564-017A	Cord, Phono
	632-218B	AM Loop Antenna
	563-655A	Coaxial Cable Assembly

PACKING OF THE SET